immediately cause electron current to flow through the platinum with a consequent increase in its potential. This in turn will raise the potential of the lead surface to a value where lead is oxidised to peroxide and, provided the electrolyte has a high conductivity and attention has been paid to the design of the bi-electrode, the whole of the lead surface will become coated with conductive lead peroxide. Wheeler (2) has, however, recently put forward the view that the sole function of the platinum is to make electrical contact between the lead and the peroxide.

It is considered that bi-electrodes of platinum with lead and lead alloys may have application in electrolytic processes, including cathodic protection, electroplating and electro-precipitation.

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References

1 L. L. Shreir and A. Weinraub — The Anodic Polarisation of Lead-Platinum Bi-electrodes *Chem. and Ind.*, 1958, 1326

2 W. C. G. Wheeler — Lead-Platinum Bi-electrodes *Chem. and Ind.*, 1959, 75

Platinum-bonded Silicides and Borides

CERMETS OF THE TRANSITION METALS

The great advantages that would follow if oxidation-resistant materials retaining great strength at very high temperatures were available are so self-evident that considerable effort and ingenuity continue to be expended in all fields which might contribute to their development.

In seeking a basis for such materials, it is tempting to look particularly to the silicides and borides of the transition metals of high melting point—titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum and tungsten. Many of these compounds have melting points of 3000°C and over, and some are among the hardest materials known. In addition, many have excellent resistance to oxidation and scaling.

If these compounds are to be used, and in particular, if they are to be bonded to form acceptable cermets, it is essential, as Dr. R. Kieffer and Dr. F. Benesovsky, of Metallwerk Plansee A.G., Reutte, Austria, point out in an excellent review of recent developments (*Powder Metallurgy*, 1958, **1/2**, 145–171) that the constitution of the various silicide and boride systems should be understood and physico-chemical properties of the resulting compounds known. Immense though the task is of determining these characteristics, very great progress—reviewed by these authors—has been accomplished during the past few years. Rather less effort has been given to bonding these compounds, but the possibility of using the platinum metals remains attractive.

Kieffer and Benesovsky report briefly the results of impregnation tests of $MoSi_2$, WSi_2 TiB_2 and ZrB_2, first pressed to compacts under 3 tons/in.^{2} and sintered at 1500°C, with a number of molten metals in argon. In these conditions both platinum and 50:50 palladium-silver alloy gave complete impregnation, although silica alone does not wet the compounds. The one apparent disadvantage of platinum is that it tended to erode the compacts—more with the silicides than the borides—and it is suggested that one method of inhibiting this erosion might be first to alloy the platinum with silicon. It appears that further work along these lines might be well justified.

J.C.C.